
Gastrochilus brevifimbriatus (Orchidaceae, Aeridinae), a New Species from Chongqing, China

Yi Si Rong,* Huang Ya, Xiao Bo, Shen Ming Liang, and Li Juan

Institute of Medicine Plantation of Chongqing, Sanquan, Nanchuan, Chongqing 408435,
People's Republic of China. *Author for correspondence: yisirong123@yahoo.cn

ABSTRACT. *Gastrochilus brevifimbriatus* S. R. Yi is described and illustrated as a new species of *Gastrochilus* D. Don (Orchidaceae, Aeridinae) from Jinfo Mountain, Chongqing Province, China. This new species is related to *G. acinacifolius* Z. H. Tsi, with both species characterized by the falcate, lanceolate leaves, the inflorescences opposite to the leaves, the yellow sepals and petals with purple spots, the similar petals and sepals, and the white lip. *Gastrochilus brevifimbriatus* differs by its longer stems (10–30 cm) and by the subflabellate epichile that is broader than the hypochile and has short fimbriae on the margins.

Key words: China, Chongqing, *Gastrochilus*, IUCN Red List, Orchidaceae.

The genus *Gastrochilus* D. Don (Orchidaceae, Aeridinae) is characterized by a saccate hypochile and two porate pollinia and comprises about 50 species that are widely distributed in tropical and subtropical Asia. Thirty-one species are recorded in China, and three species are known from Chongqing Province (Seidenfaden, 1988; Tsi, 1996, 1999; Lucksom, 2003; Jin et al., 2007; Shakya & Shrestha, 2007). The two species *G. fargesii* Schltr. and *G. nanchuanensis* Z. H. Tsi are endemic to Chongqing, while *G. intermedius* Kuntze, originally described from India, is distributed at altitudes of 1500 m in Nanchuan County, in southern Chongqing.

The Jinfo Mountain Nature Reserve, located in southern Chongqing Province, ranges in elevation from 340 to 2251 m (Yi & Huang, 2004); it is one of the most important floristic areas in southwestern China and has been considered a refugium area during glacial ice ages (Li, 1940; Guo, 1943). There are about 354 families, 1720 genera, and 6204 species of vascular plants, including 96 endemic species, that are native to Jinfo Mountain (Yi & Huang, 2004; Yi et al., 2007, 2008). In total, 110 orchid species are recorded for this region.

In 2007, an unknown entity of *Gastrochilus* with one isolated population was found on Jinfo Mountain during an excursion to collect plant specimens for a project investigating economic plants of karst regions in Chongqing. The resulting taxonomic examination

revealed this *Gastrochilus* to be a new and distinct species.

***Gastrochilus brevifimbriatus* S. R. Yi, sp. nov.**

TYPE: China. Chongqing: Nanchuan Co., Hou he, Jinfo Mtn., on trunk, 680 m, 29 Aug. 2007, Yi Si Rong 075631 (holotype, IMC). Figures 1, 2.

Haec species habitu *Gastrochilo acinacifolio* Z. H. Tsi subsimilis, sed ab eo caulibus 10–30 cm longis, foliis minoribus atque epichilo subflabellato hypochilo latiore margine brevifimbriato differt.

Epiphytic plant; stems 10–30 cm, terete, 2.8–3.2 mm diam. Leaves distichous, many, falcate to lanceolate, 6–9 × 0.8–1 cm, acute, unevenly bilobed, base sheathed and jointed; leaf sheaths tightly amplexicaul, 6–7 mm. Inflorescences opposite to leaves, 0.8–1.2 cm, 2.6–3 mm diam.; spike short, umbelliform, 2- to 4-flowered. Infertile bracts 2 to 3, tubular. Floral bracts triangular, small, 1.4–1.6 mm; pedicel and ovary 1.5–2 cm, ovary 1.5–1.8 mm diam.; sepals and petals white, tinged with yellow and spotted purple, lip white; dorsal sepal and lateral sepals similar, ovate to lanceolate, 5–6 × 2–3 mm, obtuse; petals similar to sepals, 4.3–5.2 × 1.6–2.2 mm, obtuse; lip 3-lobed; epichile ovoid to oblong, flattened, fimbriate; disk thickened and fleshy, nearly round, orange with purple spots, 2–2.3 mm; hypochile white, galeiform, ca. 5 × 3.2–3.5 mm, orange with purple maculae, bottom yellow with purple spots; lateral lobes circular, 2.8–3.2 × 3.4–3.8 mm, with purple stripes; column stout, ca. 2 mm; rostellum bilobed, lobes denticulate, ca. 1 mm, base narrow and flattened, ca. 1.7 mm; anther cap slightly obtuse and narrowly triangular with recurved-acuminate apex, 1.5–1.8 × 1.8–2.2 mm; pollinia 2, ca. 0.7 mm diam.; viscidium thick and bilobed. Capsules cylindrical with 3 dark stripes, 25–35 × 7–7.5 mm.

Distribution and habitat. *Gastrochilus brevifimbriatus* was observed on tree trunks at altitudes from 670 to 750 m in a moist valley on Jinfo Mountain in Chongqing Province. Associates of the new species include more than 90 native plants such as *Alpinia nanchuanensis* Z. Y. Zhu, *Begonia pedatifida* H.

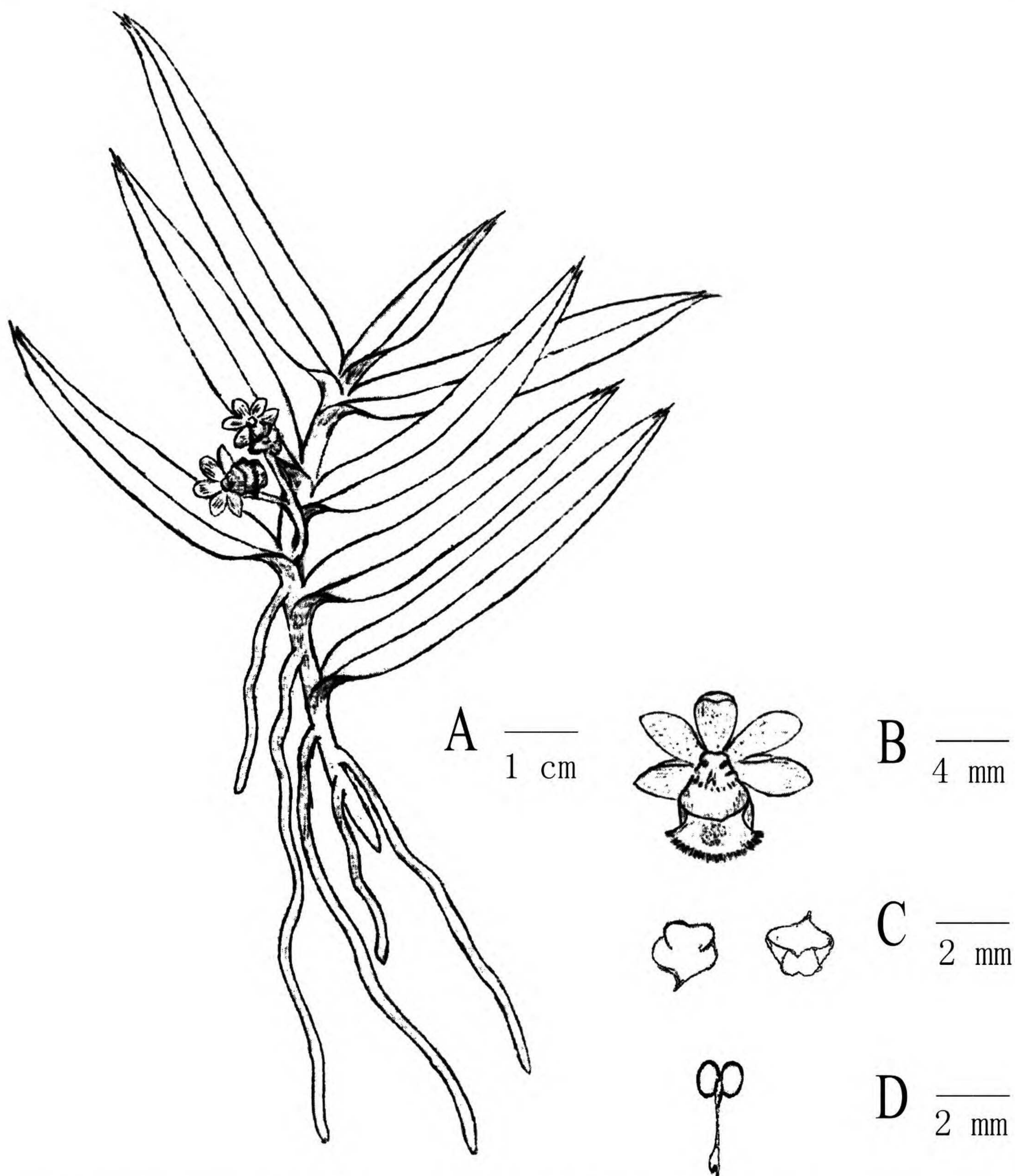


Figure 1. *Gastrochilus brevifimbriatus* S. R. Yi. —A. Fertile habit. —B. Flower. —C. Operculum (left, dorsal; right, ventral). —D. Pollinia. Drawn from the holotype Yi 075631 (IMC).

Lév., *Chimonobambusa pachystachys* Hsueh f. & T. P. Yi, *Colysis henryi* (Baker) Ching, *Debregeasia orientalis* C. J. Chen, *Dryopteris sieboldii* (van Houtte) Kuntze, *Ficus tsiangii* Merr. ex Corner, *Glaphyroidopsis jinfushanensis* Ching & Y. X. Lin, *Gymnotheca chinensis* Decne., *Houttuynia cordata* Thunb., *Microsorium fortunei* (T. Moore) Ching, *Neolepisorus ensatus* (Thunb.) Ching, *Phaius flavus* (Blume) Lindl., *Piper wallichii* (Miq.) Hand.-

Mazz., *Podocarpus neriifolius* D. Don, *Polystichum acutidens* Christ, *Vittaria flexuosa* Fée, *Zingiber striolatum* Diels, and others.

IUCN Red List category. *Gastrochilus brevifimbriatus* is endemic to Jinfo Mountain, which has a distributional area of less than 1 km². The new species is considered as Critically Endangered (CR) according to IUCN Red List criteria (IUCN, 2000).



Figure 2. *Gastrochilus brevifimbriatus* S. R. Yi. —A. Habit. —B. Infructescence. —C. Inflorescence. —D. Flower. —E. Operculum and pollinia. Photo by S. R. Yi.

Phenology. *Gastrochilus brevifimbriatus* was observed in flower from August to September, while fruits were seen from October to November of the next year.

Etymology. The specific epithet *brevifimbriatus* refers to the fimbriate marginal lobes of the apex of the labellum.

Discussion. The new species is morphologically similar to *Gastrochilus acinacifolius* Z. H. Tsi. Both taxa have falcate, lanceolate leaves, inflorescences that are opposite the leaves, yellow petals and sepals with purple spotting, and a white lip. *Gastrochilus brevifimbriatus*, however, is easily distinguished by its longer stems (10–30 cm vs. 8–11 cm in *G.*

acinacifolius), smaller leaf blades ($6\text{--}9 \times 0.8\text{--}1$ cm vs. $7\text{--}14 \times 1\text{--}2$ cm), ovate-lanceolate dorsal sepal (vs. obovate-spatulate), and ovoid to oblong epichile with a fimbriate margin and purple maculae at the base of the spur (vs. a long to circular or flat to circular epichile with a dentate margin and purple maculae at the base of the yellow pad). *Gastrochilus fargesii*, *G. nanchuanensis*, and *G. intermedius* are distributed in the same region with *G. brevifimbriatus*, and their morphological differences are shown in Table 1.

Paratypes. CHINA. **Chongqing:** Nanchuan Co., Hou he, Jinfo Mtn., on trunk, 670 m, 11 Sep. 2006 (fl.), *Yi Si Rong* 064752 (IMC), on trunk, 680 m, 26 Aug. 2007 (fr.), *Yi Si Rong* 075617 (PE).

Table 1. Morphological comparison of *Gastrochilus brevifimbriatus* and three congeners.

	<i>G. brevifimbriatus</i>	<i>G. fargesii</i>	<i>G. nanchuanensis</i>	<i>G. intermedius</i>
Stem	10–30 cm long, 2.8–3.2 mm diam.	3–13 cm long, ca. 2 mm diam.	4–7 cm long, ca. 2 mm diam.	ca. 15 cm long, 3–4 mm diam.
Leaf	falcate to lanceolate, 6–9 × 0.8–1 cm	long-circular, 2–4.5 × 0.4–0.6 cm	ovate, 1.3–1.6 × 0.6–0.9 cm	narrowly lanceolate, 5–6 × 0.7–1 cm
Inflorescence	0.8–1.2 cm long, 2- to 4-flowered	0.5–1 cm long, 2- to 3-flowered	0.5–0.7 cm long, 2- to 3-flowered	ca. 1 cm long, 2- to 3-flowered
Flower	sepals and petals white, sepal ovate to lanceolate, 5–6 × 2–3 mm; petal ovate to lanceolate, 4.3–5.2 × 1.6–2.2 mm; epichile ovoid to oblong, fimbriate	sepal and petals yellow-green, sepal ovate to long-circular, ca. 4 × 2 mm; petal long-circular, ca. 3 × 1.5 mm; epichile triangular, dentate	sepal ovate, ca. 4.2 × 3.5 mm; petal long-circular, ca. 4.1 × 2.9 mm; epichile semicircular or reniform	sepal ovate, ca. 5.5 × 2.5 mm; petal inverted-ovate, ca. 5 × 2 mm; epichile semicircular or triangular
Fruit	capsules cylindrical with 3 dark stripes, 25–35 × 7–7.5 mm	NA	NA	NA

NA, not available.

Acknowledgments. The study was supported by the fund of the National Science and Technology Key Program (2006BAC01A16). We are grateful to two reviewers for their critical comments and to X. H. Jin, H. Z. Tian, and W. C. Jin for their help during the preparation of this manuscript.

Literature Cited

Guo, L. Z. 1943. The terrain of the Quaternary glacial in east of Dabashan. *Geography* 3(3–4): 5–12.
IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
Jin, X. H., H. Li & D. Z. Li. 2007. Additional notes on Orchidaceae from Yunnan, China. *Acta Phytotax. Sin.* 45: 796–807.
Li, S. G. 1940. The references to the phenomenon of Quaternary glacier in West Hubei, East Sichuan, West Hunan and North Guangxi. *Geological Comments* 5(3): 22–27.

Lucksom, S. Z. 2003. A new species of *Gastrochilus* D. Don from Sikkim. *Orchid Rev.* 111: 278–280.
Seidenfaden, G. 1988. Orchid Genera in Thailand XIV. *Opera Bot.* 955: 285–303.
Shakya, L. R. & M. R. Shrestha. 2007. Two new taxa of Orchidaceae from central Nepal. *Edinburgh J. Bot.* 64(1): 1–5.
Tsi, Z. H. 1996. A preliminary revision of *Gastrochilus* (Orchidaceae). *Guihaia* 16(2): 123–154.
———. 1999. *Flora Reipublicae Popularis Sinicae*, Vol. 19: 399–420. Science Press, Beijing.
Yi, S. R. & Y. Huang. 2004. Preliminary floristic study on seed plants from Jinfo Mountain. *Acta Bot. Boreal.-Occid. Sin.* 24(1): 83–93.
———, ———, M. L. Shen, S. Y. Xie & G. L. Liang. 2007. Additions to the seed plants flora of Jinfo Mountain Nature Reserve in Chongqing. *Ecol. Sci.* 26: 242–245.
———, ———, B. Xiao & G. L. Liang. 2008. Preliminary study on the fern resource and flora in Jinfo Mountain. *Guihaia* 28(2): 218–225.